

TOA WIRELESS MICROPHONE model **WM-220**GENERAL DESCRIPTION

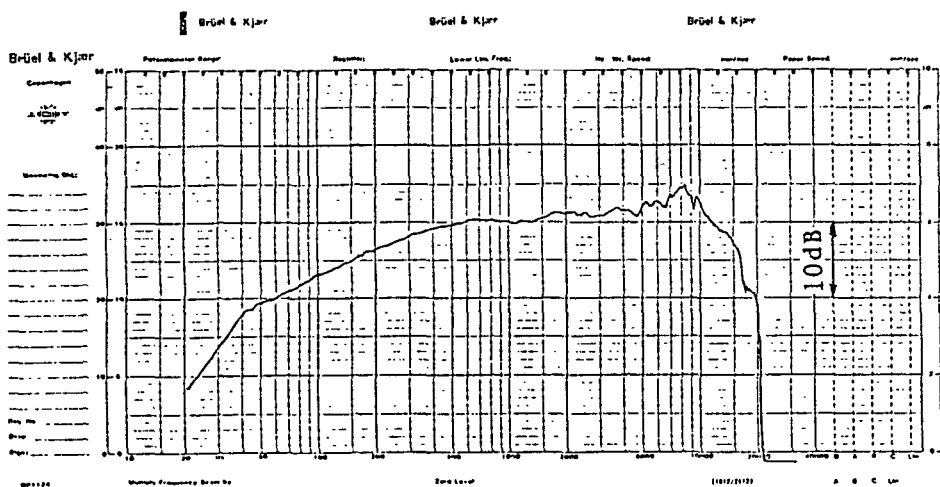
The TOA WM-220 is a crystal controlled hand-held type wireless microphone designed for operation on a specific frequency from 30MHz to 50MHz.

FEATURES

1. The WM-220 weighs just 170g and small (25.3 diameter x 167mm) enough to fit into a shirt pocket.
2. Three (3) "AAA" size alkaline batteries power the WM-220 continuously for 30 hours.
3. Adoption of crystal controlled direct frequency modulation system keeps the oscillation frequency stable against the change of ambient temperature or voltage fluctuation.
4. Dynamic range can be greatly increased, without incorporating compressor and expander, for the pickup of audio signals from a quiet whisper to a full "lung power" without overmodulation and distortion. Its unique circuit design also assures the excellent signal-to-noise ratio.
5. Human body-effect-free design assures dependable operation of the WM-220.
6. Two (2) LED's are provided for easy-to-see monitoring of the battery consumption.
7. A built-in AGC circuit acts only for excessive input, suppressing a distortion spontaneously. The AGC does not act for normal input, enabling the WM-220 to provide the same performance as that of the "wired" microphone.
8. A non-glare finished microphone body is made of metal and can fit in one's palm.
9. Switching noise produced when turning switch on and off is extremely low, virtually raising no problem for practical use.

FREQUENCY RESPONSE CURVE

Through the combination use of the WM-220 and the WT-720 receiver, the frequency response has been measured by providing a sinewave of 94dB SPL from a point 50 cm distant from the microphone head.

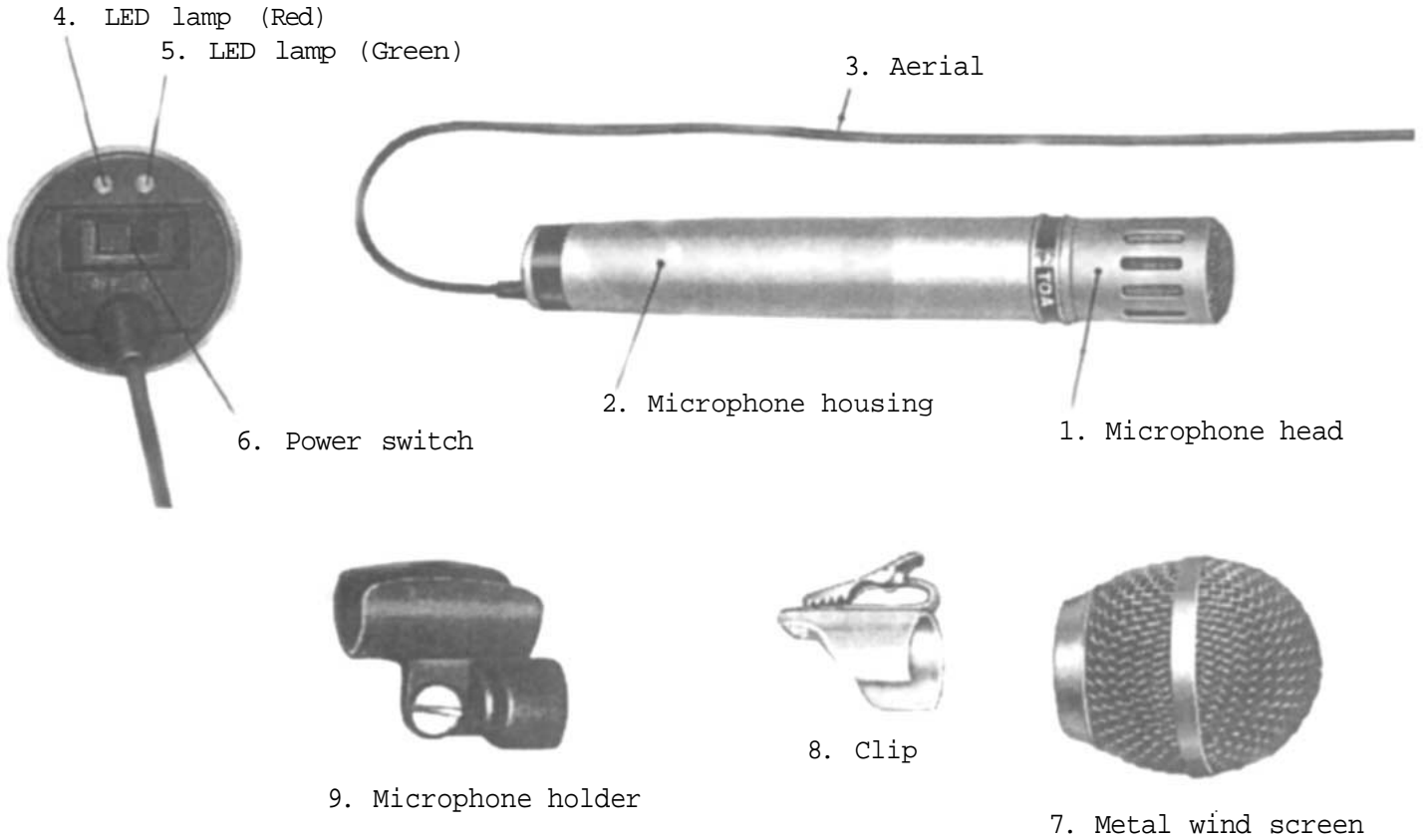


SPECIFICATIONS

Nominal carrier frequency: One of 36.7MHz, 37.1MHz and 37.9MHz
Frequency stability: Within 10kHz
Modulation system: Crystal controlled direct frequency modulation
RF output power: 40mW
Radiated output power: Less than 1mW
Harmonic and spurious output power: Less than 4nW
Radiated harmonic and spurious power: Less than 4nW
Pre-emphasis: 75µsec.
Deviation: Maximum ± 80 kHz
Modulation sensitivity: 1.7kHz at 94dB SPL (0dB=1V/µBar.)(at fm=1kHz)
Max. input S.P.L.: 127dB SPL (0dB=1V/µBar.)(at fm=1kHz)
Frequency characteristics: 70Hz to 12,000Hz ± 3dB
Distortion: Less than 0.8%
S/N ratio: Better than 87dB
Microphone element: Unidirectional electret condenser microphone
Ambient temperature range: 10°C to 40°C
Antenna: Whip, 78cm long
Operating voltage range: 3.5V to 4.5V
Battery: 3 pcs. of LR03 (size AAA) or equivalent
Battery life: Approx. 30 Hours
When alkaline batteries are used.
Dimensions: ø25.3 X 167 mm (ø1.0 x 6.6 inches)
Weight: 170g (0.37 lbs) (Batteries are included.)
Type approval No.: M-88/83 for FTZ*

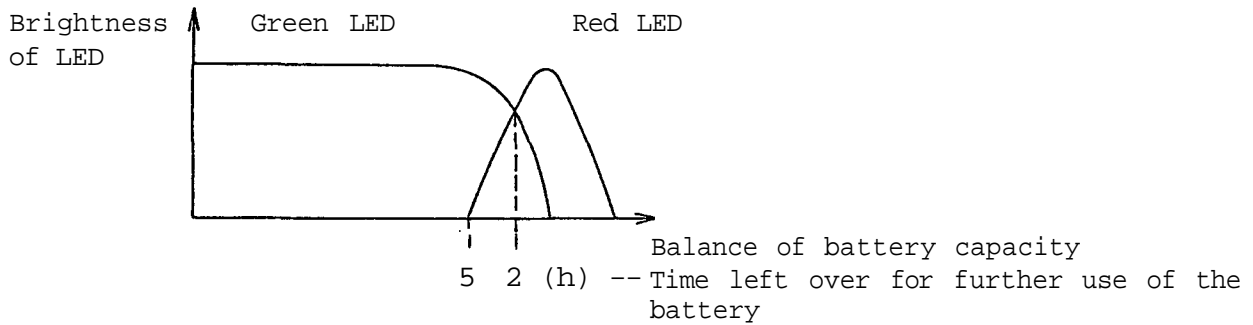
* FTZ: Fernmeldetechnisches Zentralamt (German Telecommunications Central Office).

PART DESCRIPTIONS



LED TO CHECK BATTERIES, AND TIME FOR REPLACING BATTERIES

The WM-220 employs the cross-over battery check system which permits easy-to-see monitoring of the battery status with 2 LEDs (green and red). The brightness of the both LEDs changes as shown below.

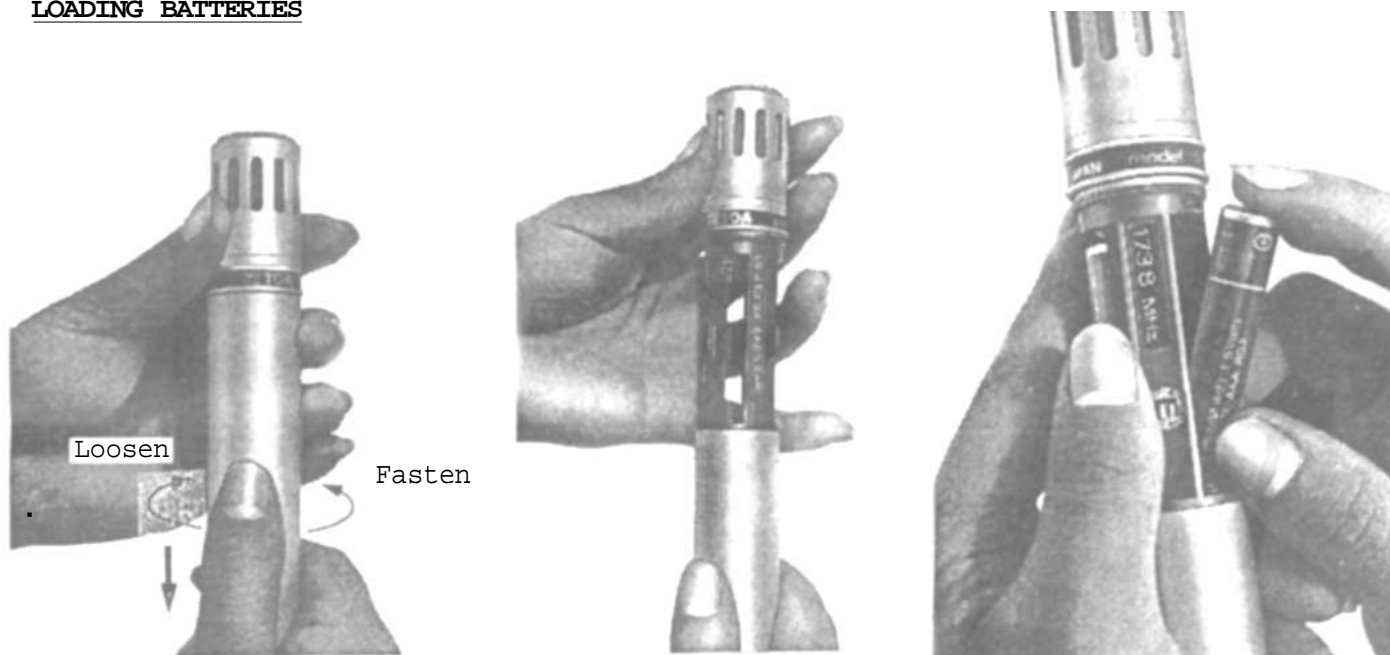


It is possible to use unit continuously for another 5 hours after the red LED comes on. When it lights more brightly than the green LED does, it signals the time that the battery needs replacement (only 2 hours is available for use until the battery capacity is exhausted).

The battery voltage is not stabilized for first several minutes after the power switch is turned on. So, perform the checking of the LED lighting several minutes after power is switched on. Also, if the red LED is illuminated more brightly than the green LED when the power switch is turned off, you should replace the battery with the new one.

The transmitter is made to give up to 30 hours of continuous operation from an alkaline battery.

LOADING BATTERIES



1. Turn a microphone housing counterclockwise holding a microphone head.
2. Pull the housing till a battery holder inside unit is exposed as illustrated. Now that the housing is designed not to go beyond a stopper, do not further pull it forcibly.
3. Insert correctly "AAA" batteries into the battery holder according to polarity indication marked on the battery holder. The polarity is negative (-) at the coil spring side, and positive (+) at the contact point side.
4. Fit the housing back in place.

PRECAUTIONS FOR USE OF BATTERY

- * Be sure to use "AAA" size batteries. Avoid to use the new and the nearly exhausted batteries altogether as this may shorten an operating time remarkably.
- * Remove the batteries if unit is to be stored for over 10 days. This will prevent any damage a defective "leaking" battery may cause.

OPERATION

1. Confirm that microphone frequency matches receiver frequency.
2. Set the microphone switch to ON, and confirm that a green LED lamp comes on.
3. When using the WM-220, the aerial should be hung vertically from the microphone.
4. With the microphone in a designated area, adjust a sound volume control of the receiver lest a howling should occur.
5. Turn the microphone switch off after use, and confirm that the LED lamp goes out.

* To wear the microphone in a costume:

Attach a clip supplied as free accessory to clothing as illustrated, and the microphone can clip on to a costume.

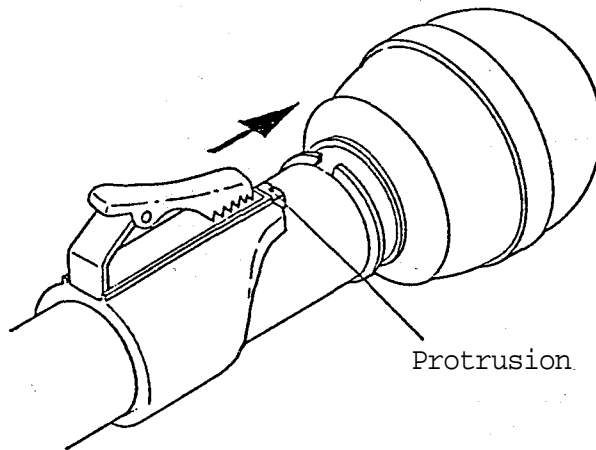


* Metal wind screen

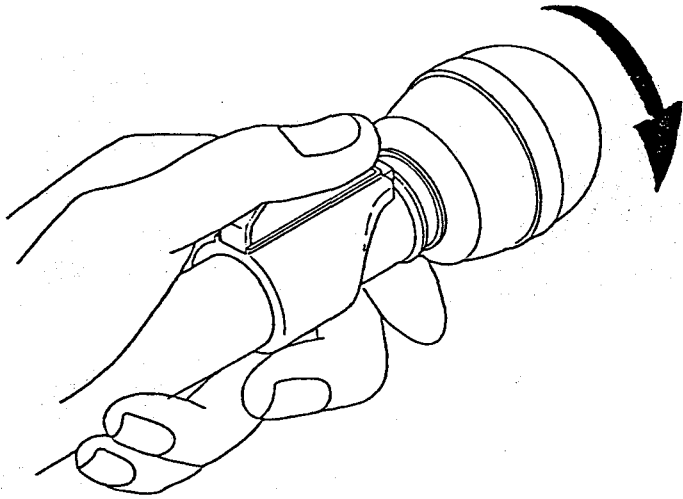
For normal hand-held use, place it over the microphone head. This eliminates the "pops" from explosive breath sounds or from wind sounds, resulting in the quality sound of high intelligibility.

Removing the wind-screen

1. Insert the protrusion of a mic clip into a cut through a round mic guard.

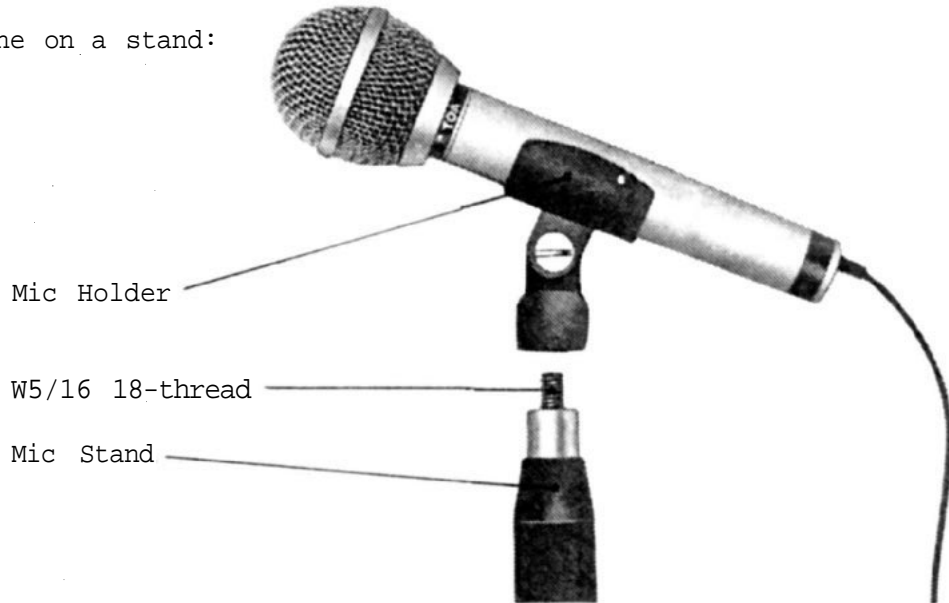


2. Turn the wind-screen as illustrated holding the protrusion tight with your finger.



Note: Insert the mic clip protrusion into the cut only when removing the wind-screen. Leaving the protrusion inserted in the cut will make it impossible to replace batteries, and also, will cause the damage of the protrusion.

* To mount the microphone on a stand:



USER CARE

1. Signal dropouts (momentary losses of reception) and noise may be suddenly encountered in a certain area as the user holding the microphone moves. These problems are caused by reflection and/or absorption of the transmitted radio waves by the walls or other objects. In such a case, change the locations of the microphone and receiver (receiving aerial).
2. Do not drop the microphone on a hard concrete floor, nor strike the microphone head front with a fist or fingers, nor blow a breath strongly into the microphone head front. Also, avoid to use the WM-220 in areas of high humidity and high temperature as this could lead to the damage of the microphone.
3. When using, the aerial should be hung vertically from the microphone. Distorting or bending the aerial in your palm can make a travelling distance of the radio waves extremely short.